

U.S. Appln. No. 09/101,236 - MATOBA et al.

IN THE CLAIMS:

Claim 1 (previously canceled).

Claim 2 (previously amended): A simulation method according to claim 37, further comprising a step of evaluating safety of said compound with respect to a human body according to the indoor behavior of said compound.

Claim 3 (previously amended): A simulation method according to claim 37, wherein said compound is introduced into an indoor space as a solution containing said compound is residually sprayed; and

wherein said media are a spraying site, suspended particles which are divided into at least one kind according to size, indoor air, a floor, a wall, and a ceiling.

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Claim 4 (original): A simulation method according to claim 3, wherein said differential equation at said spraying site is a differential equation stating a relationship among temporal change of fugacity of said compound at said spraying site, temporal change in volume of said spraying site, amount of attachment of said suspended particles to said spraying site, amount of transference of said compound between said spraying site and another medium, and change in amount of degradation of said compound at said spraying site;

wherein said differential equation in said suspended particles is a differential equation stating a relationship among temporal change of fugacity of said compound in said suspended particles, temporal change in volume of said suspended particles, amount of transference of said compound between said suspended particles and another medium, and change in amount of degradation of said compound in said suspended particles;

wherein said differential equation in said indoor air is a differential equation stating a relationship among temporal change of fugacity of said compound in said indoor air, amount of discharge of said compound outdoors, amount of transference of said compound between said indoor air and another medium, and change in amount of degradation of said compound in said indoor air;

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wherein said differential equation at said floor is a differential equation stating a relationship among temporal change of fugacity of said compound at said floor, temporal change in volume of said floor, amount of attachment of said suspended particles to said floor, amount of transference of said compound between said floor and another medium, and change in amount of degradation of said compound at said floor;

wherein said differential equation at said wall is a differential equation stating a relationship among temporal change of fugacity of said compound at said wall, temporal change in volume of said wall, amount of attachment of said suspended particles of said wall, amount of transference of the compound between said wall and another medium, and change in amount of degradation of said compound at said wall; and

wherein said differential equation at said ceiling is a differential equation stating a relationship among temporal change of fugacity of said compound at said ceiling, temporal change in volume of said ceiling, amount of attachment of said suspended particles to said ceiling, amount of transference of said compound between said ceiling and another medium, and change in amount of degradation of said compound at said ceiling.

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Claim 5 (previously amended): A simulation method according to claim 37, wherein said compound is introduced into an indoor space as a solution containing said compound is spatially sprayed; and

wherein said media are suspended particles which are divided into at least one kind according to size, indoor air, a floor, a wall, and a ceiling.

Claim 6 (original): A simulation method according to claim 5, wherein said differential equation in said suspended particles is a differential equation stating a relationship among temporal change of fugacity of said compound in said suspended particles, temporal change in volume of said suspended particles, amount of transference of said compound between said suspended particles and another medium, and change in amount of degradation of said compound in said suspended particles;

wherein said differential equation in said indoor air is a differential equation stating a relationship among temporal change of fugacity of said compound in said indoor air, amount of discharge of said compound outdoors, amount of transference of said compound between

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said indoor air and another medium, and change in amount of degradation of said compound in said indoor air;

wherein said difference equation at said floor is a differential equation stating a relationship amount temporal change of fugacity of said compound at said floor, temporal change in volume of said floor, amount of attachment of said suspended particles to said floor, amount of transference of said compound between said floor and another medium, and change in amount of degradation of said compound at said floor;

wherein said differential equation at said wall is a differential equation stating a relationship amount temporal change of fugacity of said compound at said wall, temporal change in volume of said wall, amount of attachment of said suspended particles to said wall, amount of transference of said compound between said wall and another medium, and change in amount of degradation of said compound at said wall; and

wherein said differential equation at said ceiling is a differential equation stating a relationship among temporal change of fugacity of said compound at said ceiling, temporal change in volume of said ceiling, amount of attachment of said suspended particles of said ceiling, amount of transference of said compound between said ceiling and another medium, and change in amount of degradation of said compound at said ceiling;

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Claim 7 (previously amended): A simulation method according to claim 37, wherein said compound is introduced into an indoor space as a solution containing said compound is heated to vaporize; and

wherein said media are condensed particles which are divided into at least one kind according to generation and extinction, high-concentration air, medium-concentration air, low-concentration air, a floor, a wall, and a ceiling which is divided into at least one kind according to compound concentration.

Claim 8 (original): A simulation method according to claim 7, wherein said differential equation in said condensed particles is a differential equation stating a relationship among temporal change of fugacity of said compound in said condensed particles, temporal change in volume of said condensed particles, amount of transference of said compound between said condensed particles and another medium, and change in amount of degradation of said compound in said condensed particles;

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wherein said differential equation in said high-concentration air is a differential equation stating a relationship among temporal change of fugacity of said compound in said high-concentration air, amount of discharge of said compound, amount of transference of said compound between said high-concentration air and another medium, and change in amount of degradation of said compound in said high-concentration air;

wherein said differential equation in said medium-concentration air is differential equation stating a relationship among temporal change of fugacity of said compound in said medium-concentration air, amount of transference of said compound between said medium-concentration air, amount of transference of said compound between said medium-concentration air and another medium, and change in amount of degradation of said compound in said medium-concentration air;

wherein said differential equation at said low-concentration air is a differential equation stating a relationship among temporal change of fugacity of said compound in said low-concentration air, amount of discharge of said compound outdoors, amount of transference of said compound between said low-concentration air and another medium, and change in amount of degradation of said compound in said low-concentration air;

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wherein said differential equation at said floor is a differential equation stating a relationship among temporal change of fugacity of said compound at said floor, temporal change in volume of said floor, amount of transference of said compound between said floor and another medium, and change in amount of degradation of said compound at said floor;

wherein said differential equation at said wall is a differential equation stating a relationship among temporal change of fugacity of said compound at said wall, temporal change in volume of said wall, amount of transference of said compound between said wall and another medium, and change in amount of degradation of said compound at said wall; and

wherein said difference equation at said ceiling is a differential equation stating a relationship among temporal change of fugacity of said compound at said ceiling, temporal change in volume of said ceiling, amount of transference of said compound between said ceiling and another medium, and change in amount of degradation of said compound at said ceiling.

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Claim 9 (currently amended): A simulation method according to claim + 37, wherein said compound is introduced into an indoor space as a solution containing said compound is sprayed over the whole floor; and

wherein said media are suspended particles which are divided into at least one kind according to size, indoor, air, a floor, a wall, and a ceiling.

Claim 10 (original): A simulation method according to claim 9, wherein said differential equation in said suspended particles is a differential equation stating a relationship among temporal change of fugacity of said compound in said suspended particles, temporal change in volume of said suspended particles, amount of transference of said compound between said suspended particles and another medium, and change in amount of degradation of said compound in said suspended particles;

wherein said differential equation in said indoor air is a differential equation stating a relationship among temporal change of fugacity of said compound in said indoor air, amount of discharge of said compound outdoors, amount of transference of said compound between said indoor air and another medium, and change in amount of degradation of said compound in said indoor air;

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wherein said differential equation at said floor is a differential equation stating a relationship among temporal change of fugacity of said compound at said floor, temporal change in volume of said floor, amount of attachment of said suspended particles to said floor, amount of transference of said compound between said floor and another medium, and change in amount of degradation of said compound at said floor;

wherein said differential equation at said wall is a differential equation stating a relationship among temporal change of fugacity of said compound at said wall, temporal change in volume of said wall, amount of attachment of said suspended particles to said wall, amount of transference of said compound between said wall and another medium, and change in amount of degradation of said compound at said wall; and

wherein said differential equation of said ceiling is a differential equation stating a relationship among temporal change of fugacity of said compound at said ceiling, temporal change in volume of said ceiling, amount of attachment of said suspended particles of said ceiling, amount of transference of said compound between said ceiling and another medium, and change in amount of degradation of said compound at said ceiling.

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Claim 11 (presently amended): A simulation method according to ~~claims~~ claim 3, wherein said floor is constituted by a rug having ears of fiber; and wherein a space between said ears is added to said media.

Claim 12 (original): A simulation method according to claim 11, wherein said differential equation in the space between said ears is a differential equation stating a relationship among temporal change of fugacity of said compound in the space between said ears, temporal change in volume of the solution containing said compound in the space between said ears, amount of attachment of said compound into the space portion between said ears by falling, amount of transference of said compound between the space portion between said ears and another medium, and change in amount of degradation of said compound in the space portion between said ears.

Claim 13 (currently amended): A simulation method according to ~~claims~~ claim 5, wherein said floor is constituted by a rug having ears of fiber; and wherein a space between said ears is added to said media.

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Claim 14 (original): A simulation method according to claim 13, wherein said differential equation in the space between said ears is a differential equation stating a relationship among temporal change of fugacity of said compound in the space between said ears, temporal change in volume of the solution containing said compound in the space between said ears, amount of attachment of said compound into the space portion between said ears by falling, amount of transference of said compound between the space portion between said ears and another medium, and change in amount of degradation of said compound in the space portion between said ears.

Claim 15 (currently amended): A simulation method according to ~~claims~~ claim 7, wherein said floor is constituted by a rug having ears of fiber; and wherein a space between said ears is added to said media.

Claim 16 (original): A simulation method according to claim 15, wherein said differential equation in the space between said ears is a differential equation stating a

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relationship among temporal change of fugacity of said compound in the space between said ears, temporal change in volume of the solution containing said compound in the space between said ears, amount of attachment of said compound into the space portion between said ears by falling, amount of transference of said compound between the space portion between said ears and another medium, and change in amount of degradation of said compound in the space portion between said ears.

Claim 17 (original): A simulation method according to claim 9, wherein said floor is constituted by a rug having ears of fiber; and  
wherein a space between said ears is added to said media.

Claim 18 (original): A simulation method according to claim 17, wherein said differential equation in the space between said ears is a differential equation stating a relationship among temporal change of fugacity of said compound in the space between said ears, temporal change in volume of the solution containing said compound in the space between said ears, amount of attachment of said compound into the space portion between said ears by falling, amount of transference of said compound between the space portion between said ears and another medium, and change in amount of degradation of said compound in the space portion between said ears.

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Claim 19 (previously canceled).

Claim 20 (previously amended): A computer program product according to claim 42, further comprising, in said program area,  
a program for evaluating safety of said compound with respect to human-body according to the indoor behavior of said compound.

Claim 21 (previously amended): A computer program product according to claim 42, wherein said compound is introduced into a indoor space as a solution containing said compound is residually sprayed; and

wherein said media are a spraying site, suspended particles which are divided into at least one kind according to size, indoor air, a floor, a wall, and a ceiling.

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Claim 22 (original): A computer program product according to claim 21, wherein said differential equation at said spraying site is a differential equation stating a relationship among temporal change of fugacity of said compound in said spraying site, temporal change in volume of said spraying site, amount of attachment of said suspended particles to said spraying site, amount of transference of said compound between said spraying site and another medium, and change in amount of degradation of said compound at said spraying site;

wherein said differential equation in said suspended particles is a differential equation stating a relationship among temporal change of fugacity of said suspended particles, temporal change in volume of said suspended particles, amount of transference of said compound between said suspended particles and another medium, and change in amount of degradation of said compound is said suspended particles;

wherein said differential equation in said indoor air is a differential equation stating a relationship among temporal change of fugacity of said compound in said indoor air, amount of discharge of said compound outdoors, amount of transference of said compound between said indoor air and another medium, and change in amount of degradation of said compound in said indoor air;

wherein said differential equation at said floor is a differential equation stating a relationship among temporal change of fugacity of said compound at said floor, temporal change in volume of said floor, amount of attachment of said suspended particles to said floor, amount of transference of said compound between said floor and another medium, and change in amount of degradation of said compound of said floor;

wherein said differential equation at said wall is a differential equation stating a relationship among temporal change of fugacity of said compound at said wall, temporal change in volume of said wall, amount of attachment of said suspended particles to said wall, amount of transference of the compound between said wall and another medium, and change in amount of degradation of said compound at said wall; and

wherein said differential equation at said ceiling is a differential equation stating a relationship among temporal change of fugacity of said compound at said ceiling, temporal change in volume of said ceiling, amount of attachment of said suspended particles to said ceiling, amount of transference of said compound between said ceiling and another medium, and change in amount of degradation of said compound at said ceiling.

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Claim 23 (previously amended): A computer program product according to claim 42, wherein said compound is introduced into an indoor space as a solution containing said compound is spatially sprayed; and

wherein said media are suspended particles which are divided into at least one kind according to size, indoor air, a floor, a wall, and a ceiling.

Claim 24 (original): A computer program product according to claim 23, wherein said differential equation in said suspended particles is a differential equation stating a relationship among temporal change of fugacity of said compound in said suspended particles, amount of transference of said compound between said suspended particles and another medium, and change in amount of degradation of said compound at said suspended particles;

wherein said differential equation in said indoor air is a differential equation stating a relationship among temporal change of fugacity of said compound in said indoor air, amount of discharge of said compound outdoors, amount of transference of said compound between said indoor air and another medium, and change in amount of degradation of said compound in said indoor air;

wherein said differential equation in said floor is a differential equation stating a relationship among temporal change of fugacity of said compound at said floor, temporal change in volume of said floor, amount of attachment of said suspended particles to said floor, amount of transference of said compound between said floor and another medium, and change in amount of degradation of said compound at said floor;

wherein said differential equation at said wall is a differential equation stating a relationship among temporal change of fugacity of said compound in said wall, temporal change in volume of said wall, amount of attachment of said suspended particles to said wall, amount of transference of said compound between said wall and another medium, and change in amount of degradation of said compound of said wall; and

wherein said differential equation at said ceiling is a differential equation stating a relationship among temporal change of fugacity of said compound at said ceiling, temporal change in volume of said ceiling, amount of attachment of said suspended particles to said ceiling, amount of transference of said compound between said ceiling and another medium, and change in amount of degradation of said compound at said ceiling.

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Claim 25 (presently amended): A computer program product according to claim ~~19~~ 42, wherein said compound is introduced into an indoor space as a solution containing said compound is heated to vaporize; and

wherein said media are condensed particles which are divided into at least one kind according to generation and extinction, high-concentration air, medium-concentration air, low-concentration air, a floor, a wall, and a ceiling which is divided into at least one kind according to compound concentration.

Claim 26 (original): A computer program product according to claim 25, wherein said differential equation in said condensed particles in a differential equation stating a relationship among temporal change of fugacity of said compound in said condensed particles, temporal change in volume of said condensed particles, amount of transference of said compound between said condensed particles and another medium, and change in amount of degradation of said compound of said condensed particles;

wherein said differential equation in said high-concentration air is a differential equation stating a relationship among temporal change of fugacity of said compound in said high-concentration air, amount of discharge of said compound, amount of transference of said compound between said high-concentration air and another medium, and change in amount of degradation of said compound in said high-concentration air;

wherein said differential equation in said medium-concentration air is a differential equation stating a relationship among temporal change of fugacity of said compound in said medium-concentration air, amount of transference of said compound between said medium-concentration air and another medium, and change in amount of degradation of said compound in said medium-concentration air;

wherein said differential equation in said low-concentration air is a differential equation stating a relationship among temporal change of fugacity of said compound in said low-concentration air, amount of discharge of said compound outdoors, amount of transference of said compound between said low-concentration air and another medium, and change in amount of degradation of said compound in said low-concentration air;

wherein said differential equation at said floor is a differential equation stating a relationship among temporal change of fugacity of said compound at said floor, temporal

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change in volume of said floor, amount of transference of said compound between said floor and another medium, and change in amount of degradation of said compound at said floor;

wherein said differential equation at said wall is a differential equation stating a relationship among temporal change of fugacity of said compound at said wall, temporal change in volume of said wall, amount of transference of said compound between said wall and another medium, and change in amount of degradation of said compound at said wall; and;

wherein said differential equation at said ceiling is a differential equation stating a relationship among temporal change of fugacity of said compound at said ceiling, temporal change in volume of said ceiling, amount of transference of said compound between said ceiling and another medium, and change in amount of degradation of said compound at said ceiling.

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Claim 27 (presently amended): A computer program product according to claim 49 42, wherein said compound is introduced into an indoor space as a solution containing said compound is sprayed over the whole floor; and

wherein said media are suspended particles which are divided into at least one kind according to size, indoor air, a floor, a wall, and a ceiling.

Claim 28 (original): A computer program product according to claim 27, wherein said differential equation in said suspended particles is a differential equation stating a relationship among temporal change of fugacity of said compound in said suspended particles, temporal change in volume of suspended particles, amount of transference of said compound between said suspended particles and another medium, and change in amount of degradation of said compound at said suspended particles;

wherein said differential equation in said indoor air is a differential equation stating a relationship among temporal change of fugacity of said compound in said indoor air, amount of discharge of said compound outdoors, amount of transference of said compound between said indoor air and another medium, and change in amount of degradation of said compound in said indoor air;

wherein said differential equation in said floor is a differential equation stating a relationship among temporal change of fugacity of said compound at said floor, temporal

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change in volume of said floor, amount of attachment of said suspended particles to said floor, amount of transference of said compound between said floor and another medium, and change in amount of degradation of said compound at said floor;

wherein said differential equation a said wall is a differential equation stating a relationship among temporal change of fugacity of said compound in said wall, temporal change in volume of said wall, amount of attachment of said suspended particles to said wall, amount of transference of said compound between said wall and another medium, and change in amount of degradation of said compound of said wall; and

wherein said differential equation at said ceiling is a differential equation stating a relationship among temporal change of fugacity of said compound at said ceiling, temporal change in volume of said ceiling, amount of attachment of said suspended particles to said ceiling, amount of transference of said compound between said ceiling and another medium, and change in amount of degradation of said compound at said ceiling.

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Claim 29 (currently amended): A computer program product according to claim 21, wherein said floor is constituted by a rug having ears of fiber; and

wherein a space between said ears is added to said media.

Claim 30 (original): A computer program product according to claim 29, wherein a differential equation in the space between said ears is a differential equation stating a relationship among temporal change of fugacity of said compound in the space between said ears, temporal change in volume of the solution containing said compound in the space between said ears, amount of attachment of said compound into the space portion between said ears by falling, amount of transference of said compound between the space portion between said ears and another medium, and change in amount of degradation of said compound in the space portion between said ears.

Claim 31 (original): A computer program product according to claim 23, wherein said floor is constituted by a rug having ears of fiber; and

wherein a space between said ears is added to said media.

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Claim 32 (original): A computer program product according to claim 31, wherein a differential equation in the space between said ears is a differential equation stating a relationship among temporal change of fugacity of said compound in the space between said ears, temporal change in volume of the solution containing said compound in the space between said ears, amount of attachment of said compound into the space portion between said ears by falling, amount of transference of said compound between the space portion between said ears and another medium, and change in amount of degradation of said compound in the space portion between said ears.

Claim 33 (original): A computer program product according to claim 25, wherein said floor is constituted by a rug having ears of fiber; and  
wherein a space between said ears is added to said media.

Claim 34 (original): A computer program product according to claim 33, wherein said differential equation in the space between said ears is a differential equation stating a relationship among temporal change of fugacity of said compound in the space between said ears, temporal change in volume of the solution containing said compound in the space between said ears, amount of attachment of said compound into the space portion between said ears by falling, amount of transference of said compound between the space portion between said ears and another medium, and change in amount of degradation of said compound in the space portion between said ears.

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Claim 35 (original): A computer program product according to claim 27, wherein said floor is constituted by a rug having ears of fiber; and  
wherein a space between said ears is added to said media.

Claim 36 (original): A computer program product according to claim 35, wherein a differential equation in the space between said ears is a differential equation stating a relationship among temporal change of fugacity of said compound in the space between said ears, temporal change in volume of the solution containing said compound in the space between said ears, amount of attachment of said compound into the space portion between said ears by falling, amount of transference of said compound between the space portion

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between said ears and another medium, and change in amount of degradation of said compound in the space portion between said ears.

Claim 37 (previously added): A method of stimulating an indoor behavior of a pesticidal compound, said simulation method comprising:

a step of dividing an indoor environment into predetermined medias;

a step of determining under a differential equation, the fugacities with the unit of pressure of said compound in each of said medias, wherein the fugacities are determined in at least one term terms selected from emission rate, deposition, V-change, transference, ventilation and degradation;

a step of determining at least one indoor behavior of said compound in the indoor environment from the fugacities of the compound multiplication of fugacity capacity (Z) and said fugacity (f), and further volume (V) at option in each of said medias, wherein said at least one indoor behavior is selected from a temporal concentration (N/V) and residual amount (N) under a equation N/V=fZ; and

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a step of confirming the mass balance of the compound under changing, in response to a fluctuation in the mass balance of the compound indoors, a minute time unit used when solving said differential equation.

Claim 38 (previously added): The method according to claim 37, wherein at least one of the fugacities of the compound in each of the medias is determined in terms of V-change, transference and degradation.

Claim 39 (previously added): The method according to claim 37, wherein at least one of the fugacities of the compound in each of the medias is determined in terms of ventilation, transference and degradation.

Claim 40 (previously added): The method according to claim 37, wherein at least one of the fugacities of the compound in each of medias is determined in terms of V-change, deposition, transference and degradation.

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Claim 41 (previously added): The method according to claim 37, wherein at least one of the fugacities of the compound in each of the medias is determined in terms of emission rate.

Claim 42 (previously added): A computer product comprising in a program area: a program for dividing an indoor environment into predetermined medias; a program for determining under a differential equation, the fugacities with the unit of pressure of said compound in each of said medias, wherein the fugacities are determined in at least one term terms selected from emission rate, deposition, V-change, transference, ventilation and degradation;

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a program for determining at least one indoor behavior of said compound in the indoor environment from the fugacities of the compound multiplication of fugacity capacity (Z) and said fugacity (f), and further volume (V) at option in each of said medias, wherein said at least one indoor behavior is selected from a temporal concentration (N/V) and residual amount (N) under a equation N/V=fZ; and

a program for confirming the mass balance of the compound under changing, in response to a fluctuation in the mass balance of the compound indoor, a minute time unit used when solving said differential equation.

Claim 43 (new): A method of simulating an indoor behavior of a pesticidal compound wherein said compound is introduced into an indoor space as a solution containing said compound, or residually or spatially sprayed, or heated to vaporize, or sprayed over the whole floor,

said simulation method comprising:

a step of dividing an indoor environment into predetermined medias;

a step of determining under a differential equation, the fugacities with the unit of pressure of said compound in each of said medias, wherein the fugacities are determined in terms selected from emission rate, deposition, V-change, transference, ventilation and degradation;

a step of determining at least one indoor behavior of said compound in the indoor environment from multiplication of fugacity capacity (Z) and said fugacity (f), and further volume (V) at option in each of said medias, wherein said at least one indoor behavior is

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selected from a temporal concentration (N/V) and residual amount (N) under a equation  
N/V=fZ; and

a step confirming the mass balance of the compound under changing, in response to a fluctuation in the mass balance of the compound indoor, a minute time unit used when solving said differential equation.

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Claim 44 (new): The simulation method according to claim 43, further comprising a step of evaluating safety of said compound with respect to a human body according to the indoor behavior of said compound.